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TOMORROW TODAY

ComForEn 2014

Industry Day Welcome Address

Wolfgang Hribernik

Agenda

Talks (10:00 – 13:15)

10:00	Welcome
10:10	Friederich Kupzog, AIT Energy: Smart Secondary Substations: a modular approach
10:20	Steve Van den Berghe: International Experiences of Smart Secondary Substation Technology – Smart grid at the DSO Eandis (Belgium)
10:40	Manuel Sojer, Maschinenfabrik Reinhausen: Regelbare Ortsnetztransformatoren zur Verbesserung der Netzintegration von erneuerbaren Energien
11:00	Stefan Kämpfer, ABB Belgien: Applications for smart secondary substations based on selected pilot projects
11:20	Coffee Break
11:35	Tobias Gawron-Deutsch, Siemens AG Österreich: Die Intelligente Ortsnetzstation – Demonstrator
11:50	Hermann Bühler, Bühler GmbH: Smarte Kommunikation für Smarte Netze
12:10	Thomas Bleier, AIT Safety & Security: Security Challenges in smart distribution
12:30	Michael Mansholt, 3M: Why will physical security matter to PUs in the future?
12:50	Stefan Hoppert, a-eberle: LVRSys™ - das revolutionäre Niederspannungsregelsystem
13:15	Lunch

CIGRE / IEEE EDST http://www.edst2015.org

2015 CIGRE/IEEE International Symposium on
Smart Electric Distribution Systems and Technologies (EDST 2015)

"From pilot projects to roll out of Smart Grid solutions"

Sponsored by: CIGRE SC C6

Technically Co-Sponsored by: IEEE Industrial Electronics Society (IES)

Sept: 7 – 11 2015

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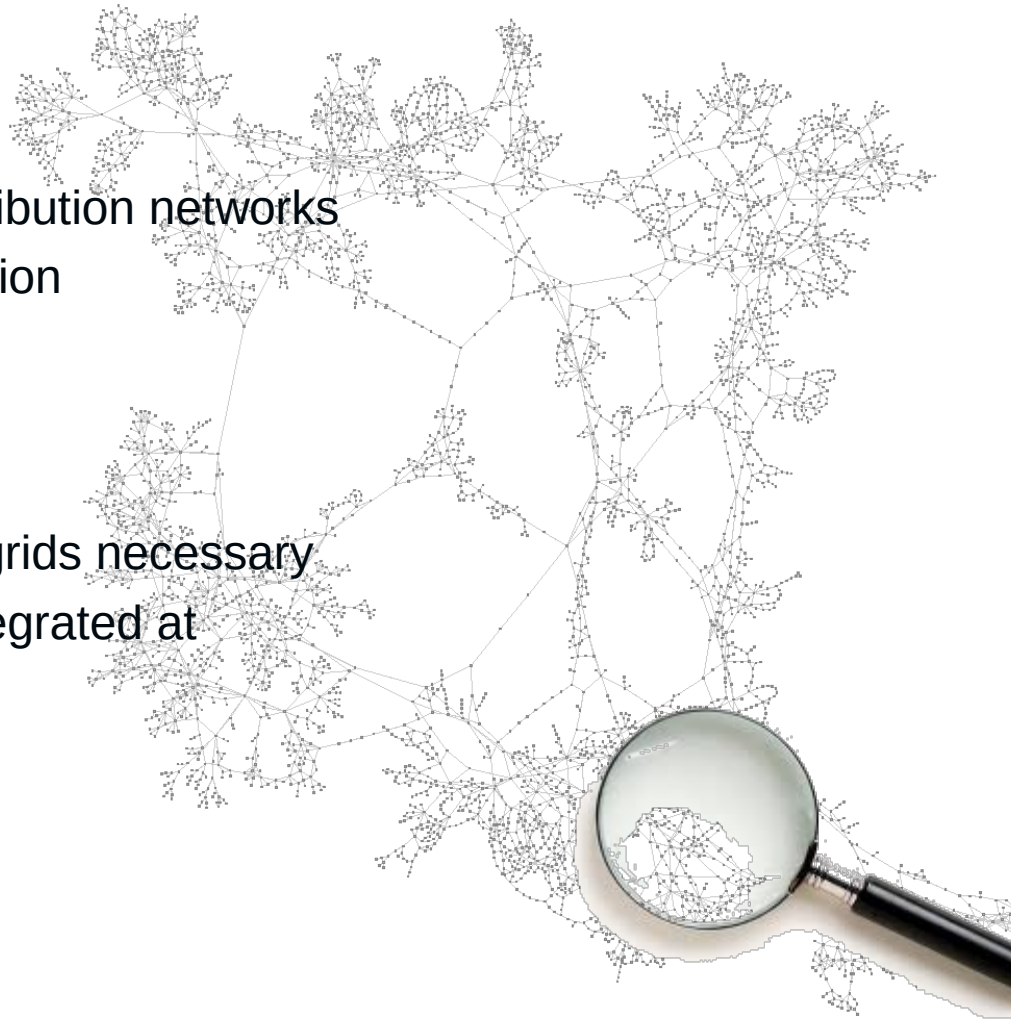
Smart and Secure Secondary Substations

A Modular Approach

Friederich Kupzog

International Context

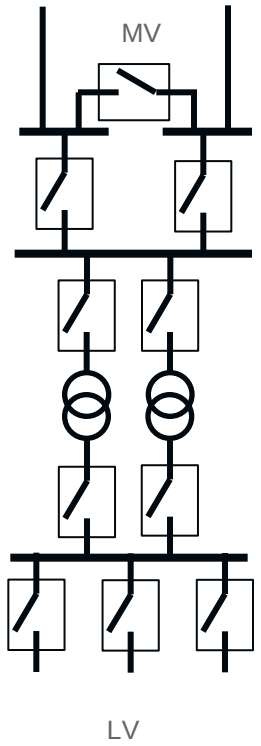
- New operation paradigms for distribution networks
  - Caused by distributed generation
  - Active demand
  - Electric mobility
  - Decentralised storage
- On-line monitoring of distribution grids necessary
- Many new functionalities to be integrated at secondary substation level

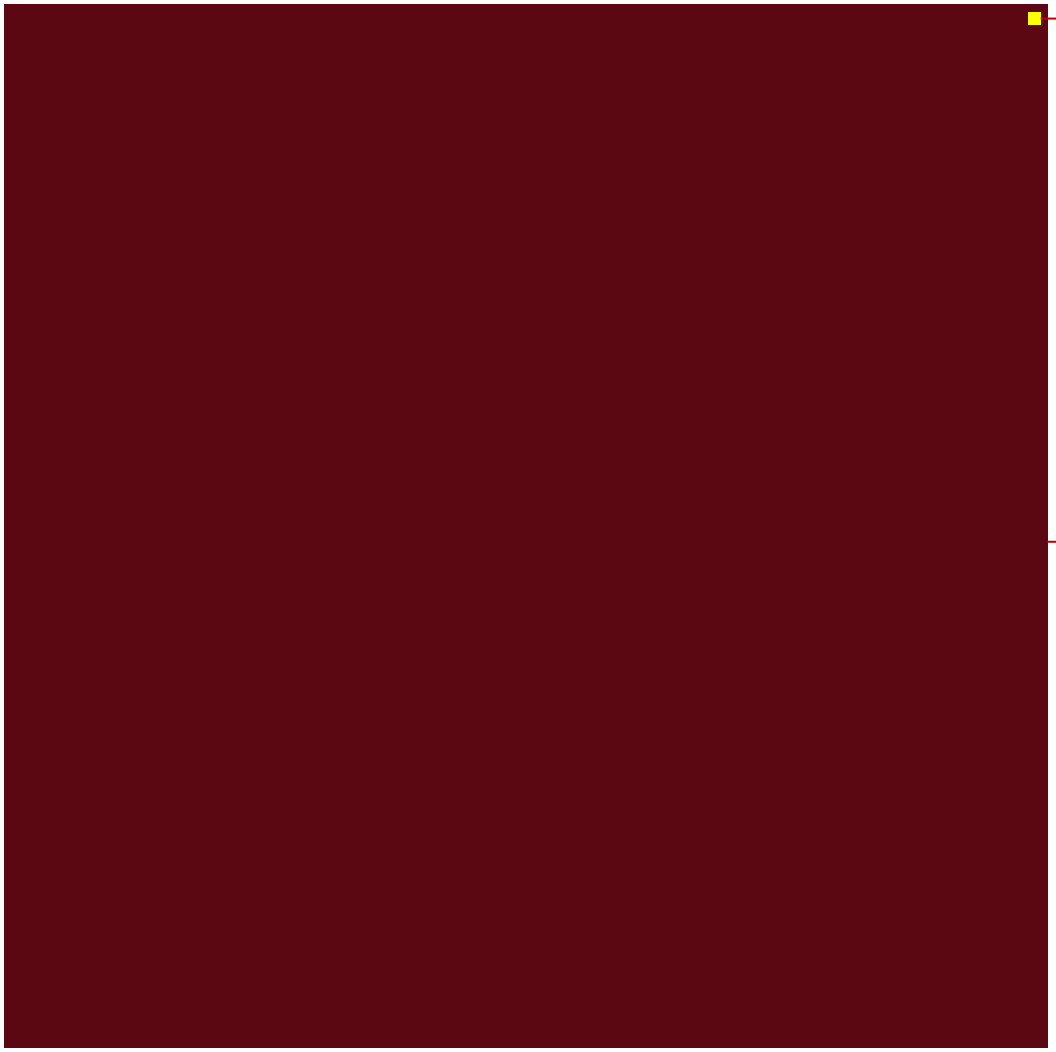


State of the art in the field

- Manually operated secondary substations
- Passive grid operation
- Grid automation ends at primary substation

- Functions today
  - Supply local LV network
  - Re-arrangement of MV feeders (optional)
  - Switching of LV feeders
  - Protection
  - Backup transformer (optional)





1 048 Primary Substations

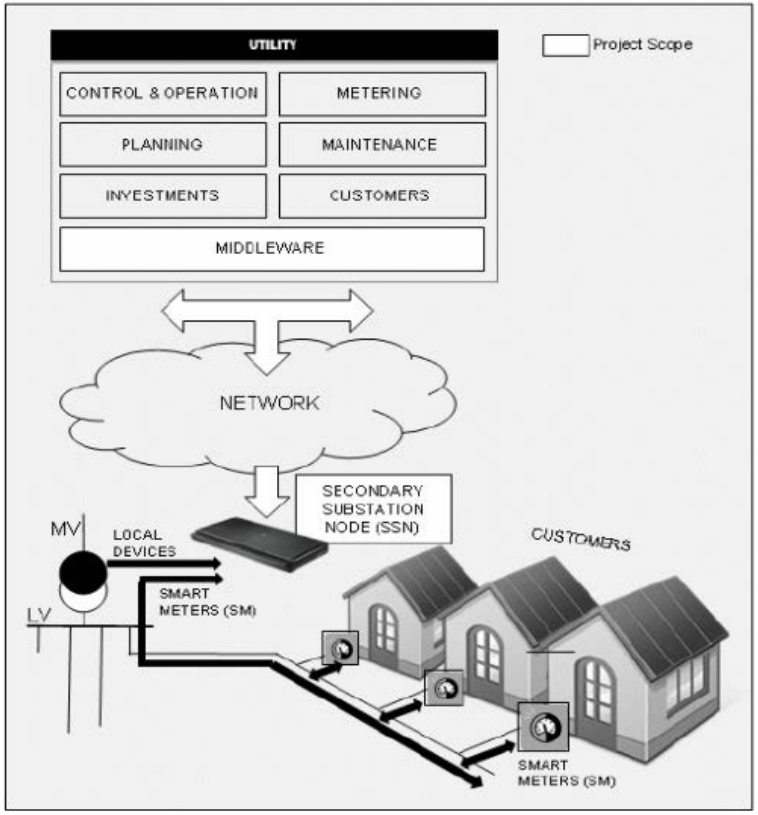
71 857 Substations in Austria
(rarly automated)

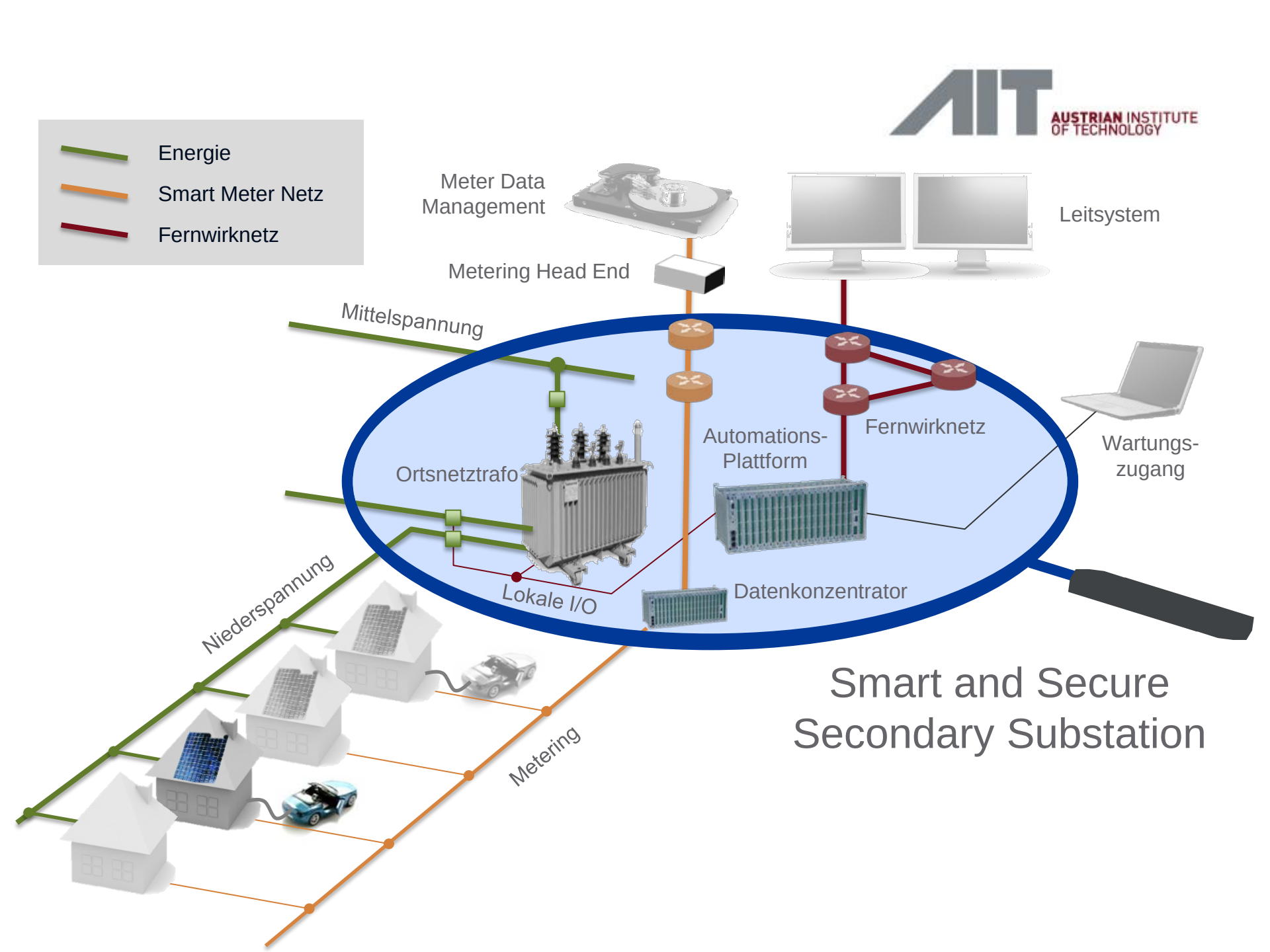
Related Work

OpenNode (2010-2012)

Iberdrola, ERDF, EDP et Al.

- Iberdrola introduces „Smart Secondary Substation“ concept
- Extensive function list
- Two prototypes developed within the project

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Energie
Smart Meter Netz
Fernwirknetz
Meter Data Management
Leitsystem
Metering Head End
Mittelspannung
Fernwirknetz
Automations-Plattform
Wartungs-zugang
Ortsnetztrafo
Lokale I/O
Datenkonzentrator
Niederspannung
Metering
Smart and Secure Secondary Substation

Functions

Data Modelling & Communication, e.g. IEC 61850 Capabilities upstream/downstream, Security Features, System Architecture (Cloud vs. Local Station), Secure and safe remote firmware update

LV Metering, e.g. Meter Detection and Verification, Meter Radings

LV Monitoring, e.g. Secondary Substation Energy Related Measurement Readings, Illegal Manipulation Detection, Fuse blown detection

LV Active Grid Control, e.g. Advanced Controller Devices

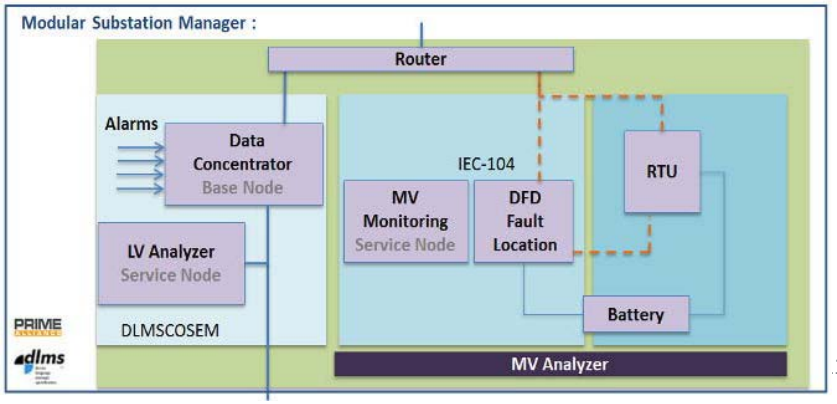
MV Fault and Shortage Management, e.g. Fault Detection, Fault Isolation, Unplanned Load shedding, Automatic Power Restorations

Energy and ICT Challenges

- Close to implementation
- Open system for future functionalities

- Power Engineering
  - Sensor technology
  - Protection
  - Safety

- ICT topics
  - Automation
  - IT integration
  - SCADA integration



Conclusion

Smart and Secure Secondary Substations ideally require

1. Modularity
   Not every substation needs all features
2. Interoperability
   Components from different vendors should fit into the modular concept
3. Extendability
   Future requirements cannot be fully stated today
4. Harmonized Reference Architecture
   Interoperability and Cyber Security go hand in hand